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ON ADOCUS, A GENUS OF CRETACEOUS EMYDIDÆ.

By E. D. COPE.

ADOCUS, Cope.

Proceed. Acad. Natl. Sciences, Phila., 1868, 235.

Character. Anterior and posterior lobes of the plastron abbreviated, narrowed, and not emarginate. Eight paired sternal bones; twelve sternal scuta, the humerals extending anteriorly, the pectorals and gulars both small. A series of plates—"intermaginals" within the marginals, on the sternal bridge. Rib heads, i. e. the capitula, wanting in the species whose costals have been examined.

This genus was originally described with *Emys beatus* Leidy from the Cretaceous Green Sand of New Jersey as the type, and its primary character was regarded as the absence of the costal capitula. In the synopsis of extinct reptilia of New Jersey, published in Prof. Cook's Geological Survey of that State, five species were numerated, as follows; *A. petrosus*, Cope; *A. firmus*, Leidy, *A. beatus*, Leidy, *A. pravus*, Leidy and *A. agilis*, Cope. The two species first enumerated having subsequently been found to possess well developed costal capitula, I referred them to *Emys*, in the "Synopsis of extinct Batrachia and Reptilia of North America," p. 126. My specimens of *A. agilis* being at the time very imperfect, it was not described.

In the present essay I propose to point out its characters, as well as those of the other species of the genus. Two species are added, the whole number being then five. One of these is from the Cretaceous deposits of Wyoming, the others from New Jersey.

The plastron in this genus presents marked peculiarity. The great reduction of the anterior and posterior lobes gives it a form pointing to that of *Staurotypus*. The anal scuta are of large size, and the humero-abdominal scutal suture (in *A. agilis*) extends across just in advance of the inguinal notch. The abdominal is the widest pair of scuta, in consequence of the relatively great longitudinal extent of the bridge; their anterior outline falls a little behind the axillary notch. The humeral scuta have a remarkable anterior extent, so much so as to lead to the suspicion that they were confluent with the pectorals, or perhaps wanting. In the case of *A. pectoralis*, having only the hyosternal bones, I was induced to think that they were really the pectorals, and that the abdominals were the true humerals, as is seen in the genus *Pleurosternum*; the posterior position of the humerals in the latter being owing to the existence of an additional pair of sternal bones. An examination of that structure in *A. agilis* and *A. wyomingensis*, dispels this view, and shows that the true pectorals are much shortened, and have an anterior position, and that the gulars are also small and narrowed, the genus approaching *Chelydra* in these respects.

The lateral series of abdominal marginals is seen in the existing genera *Macrochelys* and *Dermatemys*. The affinity of *Adocus* is to the latter, but the entire acuminate free lobes of the plastron, distinguish it well. The lateral marginal scuta in *A. agilis*, *A. wyomingensis* and *A. pectoralis*

are very distinct in our specimens, while I have seen it in only one of the two or three in which the bridge is preserved in *A. beatus*. In *A. pravus* I have not seen it, but the contracted entire xiphisternal elements pointed out by Leidy are quite like those of *A. beatus*, to which it is indeed very nearly allied.

The narrowed form of the posterior lobe is best seen in the specimen of *A. wyomingensis* described by Leidy, and in a specimen of *A. beatus* noticed by me in Synopsis Batr. Rept. N. A. p. 129. I there state that it is emarginate, an error consequent on a certain assymetry of the specimen, and its fractured condition. In *A. agilis* it is apparently rather better developed.

The form of the anterior lobe is easily seen to be narrowly reference to my figure of *A. pectoralis* (Syn. Bat. Rept. N. A.) Tab. VII fig. 1), or Leidy's figure of *A. pravus* Cretac. Rept. N. Am. XIX fig. 1. In the nearly perfect specimen of *A. wyomingensis* this portion is broken away, but Leidy describes this portion of a specimen, which has the character of the above species.

The species differ much in the relative stoutness of their shells, especially of the plastron. *A. pectoralis* is the stoutest as well as the smallest; *A. pravus* and *A. agilis* are the thinnest, the latter the largest of the genus. No portions can be certainly ascribed to the crania of this genus.

In specimens of *A. agilis*, *A. pravus*, and *A. beatus*, the longitudinal median suture of the plastron presents much irregularity from the union of the alternating bones across the point of meeting of four, by an oblique portion of the suture.

Thickness of hyosternals less than four times in the transverse extent of same; intermarginals shorter; mesosternal prolonged posteriorly; smooth below; small.

A. PECTORALIS.

Thickness of hyosternals one-eighth transverse extent of same; above with slightly impressed dots or delicate grooves, closely placed; larger, vertebral bones wider,

A. BEATUS.

Sternum thick; vertebral bones narrower; carapace more coarsely longitudinally impressed grooved; mesosternal deeply received; lateral intermarginals elongate.

A. WYOMINGENSIS.

Plastron quite thin; mesosternal deeply received into hyosternals.

A. PRAVUS.

Plastron quite thin; mesosternal occupying an open concavity of the hyosternals; surface everywhere delicately impressed punctate and grooved; intermarginal scuta very long and narrow.

A. AGILIS.

ADOCUS PECTORALIS, Cope.

Pleurosternum pectorale, Cope. Proc. Ac. Nat. Sci. Phila., 1868, 236; Trans. Amer. Philos. Soc. XIV, 1869, 130; Tab. VII, fig. 1.

Indicated by a pair of perfect hyosternal bones from the upper Cretaceous marl bed near Medford, Burlington Co, N. J.

ADOCUS BEATUS, Leidy.

Emys beatus, Cretaceous Reptiles, N. Amer. p. 107 Tab. XVIII, fig. 1-3. *Adocus beatus*, Cope, Proc. A. N. S., Phila., 1868, 235. Geological survey, N. Jersey, App. C. p. 734.

Not uncommon. It is considerably less stout than the preceding. The edges of the posterior lobe of the plastron are thinned out by an submarginal groove. As in other Emydoids there is a marked concavity for each pubic bone. The suture between the hyo- and hyposternal bones is less interlocking than in *A. agilis*, and less fine than in *A. pectoralis*. I have suggested that it may have possessed a slight mobility in life. Its face is longitudinally grooved in the hyposternal, and a corresponding convexity of the face of the hyosternal fits it. In a specimen from Medford, N. J., the posterior lobe is 5 inches 9 lin. long, and 5 inches, 8 lin. wide at the inguinal notches. Hyosternal of nearly equal thickness ; medially 7 lines.

ADOCUS WYOMINGENSIS, Leidy.

Emys wyomingensis, Leidy, Proc. Ac. Nat. Sci., Phila., 1869, p. 66.
Baptmys wyomingensis, Leidy, loc. cit., 1870, January.

Best known from an almost complete specimen consolidated by the contained mass of mineral. There are three intermarginal bones, of which the middle one is more elongate than the others. There is a weak carina on some of the posterior vertebral bones. The posterior marginal bones are not revolute. The costal bones are delicately grooved in the length of the carapace. The anterior extremity of the anterior sternal lobe is narrowed, prominent, and truncate. Length of the whole animal about two feet.

Found near Ft. Bridger, Wyoming Territory, by Dr. Van Carter.

The genus *Baptmys* to which this species is referred by Leidy, appears to be the same as *Adocus*.

ADOCUS PRÆVUS, Leidy.

Emys prævus, Leidy. Proc. Aca. Nat'l. Sci., Phila., 1856, 303. Cretaceous Rept. U. S. 108. *Adocus prævus*, Cope. Synopsis Batr. Rept. N. Am. 129.

This species is as yet known only from the original specimens, in the collection of the Geological Survey of New Jersey. The plastron is thinner than in three preceding, and the hyosternals embrace the mesosternum extensively. This distinguishes the species from *A. agilis* where the mesosternal emargination is much wider than deep. Width of anterior lobe of sternum at epi-hyosternal suture, four inches.

Upper bed of Cretaceous Green sand, New Jersey.

ADOCUS AGILIS, Cope.

Geological Survey of New Jersey, App. C. p. 734.

Represented chiefly by an almost complete plastron from the excavations of the West Jersey Marl Company, in the upper bed of the upper Cretaceous Green Sand of New Jersey.

This specimen belonged to an individual of larger size than any heretofore referred to the genus, and one characteristically ornamented by a peculiar sculpture.

The extremities of both lobes are broken off ; the margin of the posterior is thinned out, and carries an acuteness of edge to the inguinal notch where the margin is quite thick. The outline of the caudal scuta is very convex anteriorly ; that of the femorals is gently convex towards the

front. The suture between the hypo- and xiphisternals is nearly transverse below; on the upper face it sends a process into the hyposternals forwards, which is acuminate; the hyposternals send a marginal process backwards beyond the line of the median suture, which is squarely truncate; its outer edge is the margin of the bone. The impressions of contact of the pubes are well marked; they are strongly incurved, and are not very different from those seen in *Cistudo*. The bridge of the plastron is preserved, and furnishes attachment for three marginal bones; perhaps fractions of others also. The suture between the abdominal and humeral scuta is convex backwards, and unites with an inner angle of the anterior of the intermarginal series of the bridge. There are three in the latter series, all longer than broad, but the middle one relatively much narrower than the others, as it is six times longer than wide, with parallel sides. That anterior to it is more hexagonal and wider, presenting an angle inwards for union with the suture between the abdominal and humeral scuta.

About half the mesosternal bone is preserved. It is a transverse diamond with truncate extremities. Its posterior angle is therefore very open, but is not rounded. No suture bounding either humeral or gular scuta is visible on it; the anterior angle is broken away. The anterior portion of the episternal bone preserved has a regular convex outline, and is quite thin.

The sculpture of the inferior surface is a slight imitation of that seen in some species of *Trionyx*. It is closely shallow-punctate, or like small rain-drop impressions. These are irregularly distributed on the anterior part of the plastron, and on the posterior lobe in obliquely decussating series.

Measurements.

	M. M.
Width of plastron at bridge,	0.2879
Length between mesosternum and xiphisternum,	0.21
Width posterior lobe at inguinal notch,	0.1835
“ mesosternum,	0.091
Length “	0.0695
“ hyosternum medially,	0.09
Thickness “ “	0.012
“ “ at marginal suture,	0.007
Length abdominal suture,	0.1063
“ femoral “	0.087
Length median intermarginal suture,	0.0825
Width “ “ “	0.015
Estimated length plastron,	0.45
“ “ carapace,	0.56

This species, the largest of the genus, is found in the upper green sand bed of the upper Cretaceous of New Jersey. The specimen from which the above description was taken, was found by my friend I. C. Voorhees, in the pits of the New Jersey Marl Company, and by the permission of the latter submitted to the writer.